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JPRS: 4584

4 May 1961

TRANSLATED DATA ON MALARIA AND TOXOPLASMOSIS IN THE USSR

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## FOREWORD

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JPRS: 4584

CSO: 1627-S

TRANSLATED DATA ON MALARIA AND TOXOPLASMOSIS IN THE USSR

Following are the translations of two articles in Meditsinskaya parazitologiya i parazitnaya bolezni (Medical Parasitology and Parasitic Diseases), Vol 30, No 1, Moscow, Jan-Feb 1961, pages 3-5 and 84-86 respectively.

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## MALARIA HAS BEEN PRACTICALLY ERADICATED IN THE USSR

Following is the translation of an unsigned article in  
Meditinskaya parazitologiya i parazitnyya bolezni  
(Medical Parasitology and Parasitic Diseases), Vol 30,  
No 1, Moscow, Jan-Feb 1961, pages 3-5.

The Central Committee of the Soviet Communist Party and the USSR Council of Ministers, in their decision "On Measures for the Further Improvement of Medical Services and the Health Protection of the USSR's People," made a special point of proposing measures for the eradication of a number of infectious diseases, and of malaria in particular. Measures designed for malaria's complete eradication have been under way for several years.

When one considers the turnover-rate of malarial illness and the scope of antimalarial measures taken during the last few years, 1960 must be regarded as the climaxing year in the eradication of malaria in the Soviet Union. If the data on new malarial illnesses are noted for nine months of 1960 (these months include almost entirely the epidemic season), it can be stated that malaria has been practically eradicated in the Soviet Union.

Of the 289 new malarial illnesses registered during nine months of 1960, 32 are cases imported from foreign countries where malaria is still widely prevalent: OAR, Guinea, DRV (North Viet-Nam?), KNR (Chinese People's Republic ?), and others.

Of the indicated 289 malaria cases, 132 were registered in the first half of 1960. These cases were related to infections during the epidemic season of 1959, since these are relapses, or cases of three-day malaria which has a long incubation period.

New cases of malarial infection in 1960, including the imported malarial cases, came to a total of 161 during nine months of 1960, i.e., 0.8 per 1,000,000 inhabitants.

In nine months of 1960, malarial illness was totally absent in the Baltic Republics, the Khirgiz SSR; in the BSSR (Belorussiya) - there was one malarial case, which had been imported. In the Moldavian SSR one case was registered in the first half of the year. Of the 72 autonomous republics and the districts, areas, and cities under the republican rule of the RSFSR, 42 had not registered a single case of malaria. In the rest, there occurred only scattered malaria cases; 76 in all, counting those imported from abroad.

It can also be stated that malarial illness was almost completely absent in the Transcaucasian Republics, since in the Armenian SSR there were three cases; of these, two were in the first half of the year. In

the Georgian Republic there were 15, ten of them in the first half of the year. As a result of anti-malarial measures taken during the last few years, there was a sharp decrease of malarial illness compared to 1959 in the Azerbaijan SSR, which had, as late as 1959, been a basic focus of malaria. During the first half of 1960, 34 patients were registered, compared to 567 in the corresponding period of 1959; in the third quarter of 1960, 43 patients, contrasted to 270 in 1959. For the Republic as a whole, during the nine months of 1960 there were 77 patients, compared to 837 patients in the same months in 1959. There was a concurrent decrease in the number of malaria carriers from 1331 to 33, a result of mass malaria examinations of the people as great in scope as those conducted in 1959.

As mentioned above, there was not one malaria patient in the Central Asian Republics of the Khirgiz SSR. In the Uzbek SSR there were seven patients, two of these occurring in the first half of the year; in the Turkenan SSR, five cases, with four of these in the first half of the year. In the Kazakh SSR, eleven oblasts had no patients; in the remaining five oblasts, 44 patients were registered during the nine months of 1960. This was in contrast to 109 patients during the equivalent period of 1959. Of the 44, 30 occurred during the first half of the year, and of the 44, 21 were patients who had come from the Chinese People's Republic.

In the Tadzhikh SSR, malaria was completely absent in all regions, except those which border on Afghanistan. In these regions in 1960, mass examinations were repeated on the people living in the border zone in order to discover malaria cases and also to determine the reasons why malarial illnesses still occur here.

The authenticity of the practical eradication of malaria in the USSR is confirmed by the data of mass blood examinations for malaria, which were conducted on fever patients in hospitals and polyclinics, and on regional populations where malaria was formerly registered.

Mass examinations during the first half of 1960 (including 3,237,167 blood examinations) show a total of 54 cases in which malarial parasites were discovered. This is 16 cases per 1,000,000 examined blood specimens.

In order to typify the state of malarial illness, let us look at certain comparative figures relevant to different periods in the struggle with malaria in the USSR; the same system of case statistics will be used throughout (viz., the patient's initial medical consultation).

The pre-war year of 1940 showed the lowest figures for malarial illness, 3,176,527 malaria patients were registered. In 1946, the first post-war year, before recovery from the adverse sanitary consequences of the war there were 3,364,502 patients. In 1950, the termination of the first post-war five year plan, there were already 781,329 patients; in 1952, the year when malaria as a mass disease was eradicated in the USSR, there were 183,606 cases. In 1955, the end of the second post-war five year plan, there were 35,704 cases. For 1958, 1959, and 1960, the corresponding figures are 2,504, 1,599, and 289 malaria cases. These

data allow us to speak of the practical eradication of malaria both in the USSR as a whole, and in each of the Soviet Republics. As a result of vigorous measures directed toward the eradication of malaria in the remaining regions still affected in 1958 and 1959 in the Azerbizhan SSR and the Yakutsk ASSR, it was possible to eradicate it in 1960. In 1960 in the Yakutsk ASSR, there were five malaria cases, all of them in the first half of the year only.

The success in improving the nation's health in respect to malaria confirms the soundness of a scientifically based system of anti-malarial measures, which were accomplished in the USSR by noting local peculiarities of malarial epidemiology.

Effective fulfillment of the work in the fight against malaria was possible because it was conducted with the help and participation of local, Party, soviet, and agricultural organizations, and with widespread popular interest in the work.

The USSR Ministry of Health, in order to help in the work's organization, sent strong anti-epidemic divisions which were, in turn, directed by workers from the Institute of Medical Parasitology and Tropical Medicine im=eni E. I. Martsinovskiy of the USSR Ministry of Health in the Azerbaijan and Kazakh SSR. Similar divisions from the RSFSR Ministry of Health were directed by workers from the Republican Institute of Parasitology in the Yakutsk SSR. These divisions were staffed by specialists supplied by the Ministries of Health of the RSFSR, USSR, Moldavian SSR, and BSSR. These included malaria specialists, entomologists, and qualified laboratory technicians.

In spite of the success in the fight against malaria, it is nevertheless necessary to emphasize that prolonged work is needed in re-enforcing the results. The natural climatic conditions, especially in the Southern USSR Republics, combined with the large migrations can lead to the reappearance of local malaria if any is introduced from abroad.

For these reasons, a complex of prophylactic measures and unremitting attention to the protection of USSR popular health from malaria is imperative during the next number of years.

The eradication of malaria in an enormous area of the Soviet Union is a valuable contribution of Soviet medical workers toward the successful fulfillment of industrial and agricultural production quotas, since malaria, during many scores of years, was a mass disease of the population and detracted millions of work-days from industrial and kholhoz workers.



## DATA ON THE STUDY OF TOXOPLASMOSIS FOCI IN NATURE

[Following is the translation of an article by Z. V. Dunayeva and D. N. Zasukhin in Meditssinskaya parazitologiya i parazitnyye bolezni (Medical Parasitology and Parasitic Diseases), Vol 30, No 1, Moscow, January-February 1961, pages 84-86.]

One of the most important aspects of the toxoplasmosis problem today is the development of effective prophylactic measures for humans, domestic animals, and animals used in agriculture. To achieve this, the study of its epidemiology and epizootology is imperative.

Toxoplasmosis is a disease which has its focus in nature. The round of toxoplasmosis hosts is large--domestic and wild mammals, and birds. ([Note:] Lately, information has come in that toxoplasmosis was found in amphibia (Rinto, 1958).)

The epizootology of toxoplasmosis has been described in certain animals (rabbits, field mice, dogs, ewes, pigs, large horned cattle, chickens, pigeons, and others).

The isolation of the causative agent of toxoplasmosis has been accomplished by many research workers with the use of serological and allergy methods. The non-symptomatic carrying of toxoplasmosis by a number of animals has also been shown.

A number of parasites morphologically resembling toxoplasms have been described recently. J. Frenkel (1956, USA) described the parasite *Besnoitia jellisoni*, found in the rodent, *Peromyscus maniculatus*. He also described the so-called M-organism which also has a resemblance to toxoplasms. In the brain of the red field mouse (*Clethrionomys glareolus*), Erhardova (1955) discovered parasites morphologically resembling *T. gondii*, but differing in certain other aspects (size, position of the nucleus). She described them as a new form of *T. glareoli*. D. N. Zasukhin, E. A. Shevkunova, and B. E. Karulin (1958) discovered in the red-grey field mouse (*Clethrionomys rufocanus*) and in the Siberian red field mouse (*C. rutilus*), parasites morphologically resembling those described by Frenkel (1956), and Erhardova (1955).

During the summer seminars in 1958 and 1959, we investigated wild animals for spontaneous infection with toxoplasmosis. Our work locale was Kalinin Oblast, Maksatikhinsk Rayon, in the vicinity of the village of Khabary (P. A. Petrisheva, V. A. Lebedev, et al., 1959).

The animals caught were dissected; from pieces of the organs (liver, lungs, heart, kidneys, and spleen), as well as from the brain, impressions and smears were made on microscope slides. These were fixed with methyl alcohol and stained by the Romanovsky-Gimza method. We prepared smears from 1,530 mammals with 20 different aspects.

In order to isolate toxoplasms, we also made bioprobes on white mice under field conditions. Four hundred and sixty-six animals were examined with this method: 386 shrews (*Sorex araneus*), 18 water shrews, 39 red field mice (*Cl. glareolus*), 18 common field mice, two wood mice, one weasel, one wood dormouse, and one water rat.

The white mice were infected intraabdominally with a suspension prepared from the brain, liver, and spleen of the animals. Subinoculations were made from four to nine times. In each series, we took for infection purposes two or three mice that were inoculated with a suspension made from two to ten animals. We did not succeed in isolating toxoplasmosis in any of the 75 bioprobes.

At the same time in studies of the imprints and smears, we discovered *Toxoplasma gondii* in the organs and brain of insectivores. These parasites were found in smears from the organs of shrews (*Sorex araneus*, *S. macropygmaeus*, *S. minutus*) and, in isolated cases, in one water shrew, and one mole. These parasites had a typical appearance and were found most often in the brain (14), liver (11), and more rarely, in the spleen (3). In the shrews, toxoplasms were found singly throughout the smear or in groups, but were always scattered. In the 1959 data, however, toxoplasms found in shrews were not only scattered, but also in the form of pseudocysts, whose characteristics provide the basis for regarding them as typical *T. gondii*.

To date, there has been only one indication of finding toxoplasms in insectivores: that by Prowazek (1910), who found a new type (*Toxoplasma talpae*) in the mole's liver.

As we saw, isolation of the parasite by the bioprobe method in white mice gave negative results. Also negative were those bioprobes which included organs of animals whose smears showed toxoplasms. It seems that the parasites we found were thoroughly adapted to insectivores and were not sufficiently virulent for the white mice. To isolate toxoplasm strains from wild animals by the bioprobe method, animals more susceptible than white mice must obviously be used. Thus, Simich (1957) used spermophiles successfully in isolating toxoplasms (bioprobe method) from dogs with latent toxoplasmosis.

In ascertaining toxoplasmosis in mice which had received subinoculations, we examined their sera by using the reaction of complement binding with toxoplasmodic antigen. Of the sera of 60 mice, five gave repeated positive results to ++, +++, and +++. Four of the five mice were infected by shrews, and one by a red field mouse.

In the impressions and smears collected from other animals, we also discovered other blood and tissue parasites. Thus, in *S. araneus* and *S. europus* we found three cases of *Grahamia* in the erythrocytes. In liver and spleen smears from two field mice, *C. glareolus* and *M. arvalis*, lamblia were found. At first we supposed that these parasites had been introduced accidentally during the preparation of the smear, but the last was absolutely clean, with no bacteria; thus, for the time being we refrain from drawing any conclusions. Hepatozoon was found in the liver, spleen, and brain of *S. araneus*, *N. fodiens*, *S. betulina*, and in five *C. glareolus*. In all, there were eight cases.



## CONCLUSIONS

- 1) Toxoplasms were found in shrews (*Sorex araneus*, *S. macropygmaeus*, and *S. minutus*) during studies on wild mammals in the Kalinin Oblast.
- 2) We did not succeed in isolating strains of these parasites with the bioprobe method.

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